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(54) **Cargo protection device and a corner element therefor**

(57) The present disclosure relates to a corner element (38, 40) for attachment of a cargo protection device (14) to an interior (10) of a vehicle (12). The corner element comprises a holding portion (42), adapted to be located at least partly in or at an upper corner (24, 26) of the cargo protection device, and an attachment portion (44) for attachment of the corner element to the interior of the vehicle. The holding portion comprises a first leg (46) and a second leg (48) connected by a central portion (50), the first leg extending from the central portion in a first direction (D_1) and the second leg extending from the central portion (50) in a second direction (D_2), such that the first and second directions in an untensioned state of the holding portion form an angle α with each other with $90^\circ < \alpha < 110^\circ$. The attachment portion extends from the central portion in a third direction (D_3), which has a first component in a direction opposite to the first direction and a second component in a direction opposite to the second direction.

The disclosure further relates to a cargo protection device, comprising a foldable and/or rollable fabric portion (20) and at least one such corner element, and a method of attaching such a cargo protection device to the interior of the vehicle.

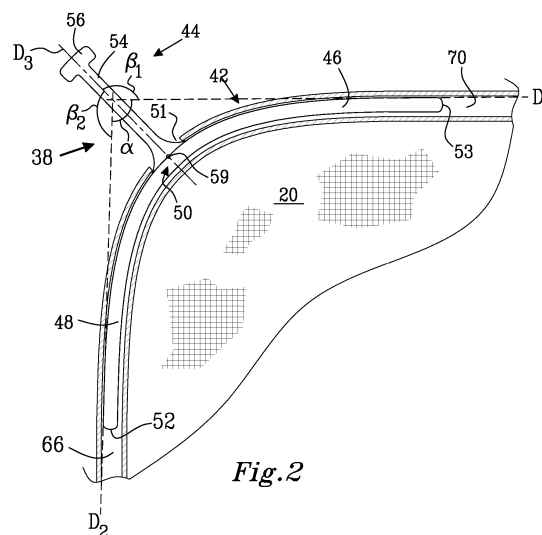


Fig.2

Description

TECHNICAL FIELD

[0001] The present disclosure relates to a corner element for attachment of a cargo protection device to an interior of a vehicle. The disclosure further relates to a cargo protection device comprising a foldable and/or rollable fabric portion and at least one such corner element, a vehicle comprising such a cargo protection device and a method of attaching such a cargo protection device.

BACKGROUND

[0002] It is well known to use a cargo protection device in a vehicle in order to protect the users of the vehicle from cargo being thrown from the luggage compartment onto the users of the vehicle, e.g. when braking the vehicle, or in case of a collision. The cargo protection device may e.g. comprise a net. The upper corners of the cargo protection device are, when in use, attached to a ceiling of the vehicle or to upper side walls, and the lower corners may be attached to the interior of the vehicle.

[0003] In order for the cargo protection device to work properly, it is desirable that it covers the open space between the backrests of the seats and the ceiling. Therefore, it is common according to prior art to provide a stiff bar at the upper edge of the cargo protection device in order to retain the upper edge of the cargo protection device taut. However, the stiff bar makes it more difficult to store the cargo protection device, when not in use. Further, the upper edge will follow a straight line, which is not adapted to the shape of the ceiling of a vehicle, which usually is at least slightly curved. This may result in an interspace between the upper edge of the cargo protection device and the ceiling of the vehicle, through which opening cargo might pass if being thrown forwards.

[0004] According to another technical solution of the prior art, the upper edge of the cargo protection device may be provided with an upper edge element like a metal wire or similar element. This solution makes the cargo protection device foldable or rollable, facilitating storage, when not in use. By tensioning the upper edge element, the upper edge can be retained taut. However, also for this technical solution, the upper edge is straight, when in use, resulting in an interspace between the upper edge of the cargo protection device and the ceiling of the vehicle.

[0005] Further, many cargo protection devices of the prior art solutions are complicated to attach to the vehicle interior. Firstly, it may be difficult to unpack the cargo protection device from its storage. Secondly, it may be complicated to attach the cargo protection device to the interior of the vehicle. For example, the size of the cargo protection device or the lengths of its attachments may have to be manually adjusted in order to retain the cargo protection device taut.

[0006] There is thus a desire for an improved cargo

protection device.

[0007] Many of the properties of the cargo protection device are derived from corner elements used for attachment of the cargo protection device to the interior of the vehicle. There is thus also a desire for an improved corner element of the cargo protection device.

SUMMARY

[0008] The object of the present disclosure is to overcome or ameliorate at least one of the disadvantages of the prior art, or to provide a useful alternative.

[0009] The object above may be achieved by the subject-matter of claim 1.

[0010] Thus, in a first aspect of the present invention there is provided a corner element for attachment of a cargo protection device to an interior of a vehicle, the corner element comprising a holding portion, adapted to be located at least partly in, or at, a corner of the cargo protection device intended to be upwards, when the cargo protection device is mounted in the vehicle, and an attachment portion for attachment of the corner element to the interior of the vehicle. The holding portion comprises a first leg and a second leg connected by a central portion, the first leg extending from the central portion in a first direction and the second leg extending from the central portion in a second direction, such that the first and second directions in an untensioned state of the holding portion form an angle α with each other, with $90^\circ < \alpha < 110^\circ$. The attachment portion extends from the central portion of the holding portion, in a third direction, which third direction has a first component in a direction opposite to the first direction and a second component in a direction opposite to the second direction.

[0011] Positional references used herein, such as upper, lower back and front, relate to when the cargo protection device is mounted in the interior of the vehicle by means of the corner element. However, the cargo protection device can be dismounted from the interior of the vehicle, and stored or transported as folded and/or rolled. The corner element may be sold as a separate item, or it may be sold together with the cargo protection device. The cargo protection device may be sold as a separate item, or it may be sold together with the vehicle.

[0012] The holding portion bridges the first and second legs and provides a suitable location for connecting the attachment portion to the rest of the corner element. The attachment portion is suitably non-rotationally connected to the holding portion. Purely as an example, the corner element may be made of a rigid material, such as a metal or a metal alloy, e.g. steel, and the attachment portion may be welded to the central portion.

[0013] The size of the corner element is typically much less than the size of the cargo protection device, e.g. the length of the legs being between 50 and 300 mm, preferably between 75 and 200 mm, more preferably between 100 and 150 mm and the length of the attachment portion being between 10 and 200 mm, preferably be-

tween 20 and 150 mm, more preferably between 50 and 100 mm. The length of the holding portion may be shorter than that of the legs, e.g. between 1 and 100 mm, preferably between 2 and 75 mm, more preferably between 5 and 50 mm.

[0014] Typically, the cargo protection device comprises four corners, two of which are intended to be located upwards, i.e. upper corners, when the cargo protection device is mounted in a vehicle, and two additional corners, which are intended to be located downwards, i.e. lower corners, when the cargo protection device is mounted in a vehicle. The corner element of this disclosure is intended to be used in or at the two corners intended to be upwards, when the cargo protection device is mounted in a vehicle.

[0015] The angle α is preferably chosen, such that the cargo protection device when tensioned substantially follows the shape of a ceiling of the vehicle, in which the cargo protection device is intended to be mounted, which ceiling typically has a certain curvature. Therefore the angle α is above 90° , since 90° would have corresponded to a completely flat ceiling. The angle α may e.g. be above 91° , above 92° or above 95° . Appropriate values for an upper limit of the angle α would be 100° , 110° , 120° or 130° . The upper limit for the angle α may be determined by the curvature of the ceiling.

[0016] The angle α is further preferably chosen, such that the corner element will tension the cargo protection device, and especially its upper edge, in order to retain it taut, when applying a force at a lower portion of the cargo protection device, preferably at a lower edge of the cargo protection device, more preferably at or adjacent to one, or each, of the additional corners at the lower edge of the cargo protection device.

[0017] If the legs are curved, i.e. not straight, the angle α may be defined by the directions of a tangent to the shape of the legs at the ends of the respective leg.

[0018] When the cargo protection device is tensioned, the angle α may change. If the corner element is made of a rigid material, the angle α will substantially not, or not at all, change under the tension forces applied, when mounting the cargo protection device in the vehicle. The corner element may help to receive and distribute impact forces in case of a collision involving the vehicle, e.g. a frontal collision pushing the cargo forwards against the cargo protection device. The collision forces are higher than the forces used, when mounting the cargo protection device and may be high enough to elastically and/or plastically deform the corner element. The rigidity of the corner element may be increased by providing the central portion with a reinforcement, e.g. increasing the thickness and/or the width of the central portion.

[0019] The third direction is partly opposite to the first direction and partly opposite to the second direction. It has a first component in a direction opposite to the first direction and a second component in a direction opposite to the second direction. Both these components are positive and different from zero. When the cargo protection

device is mounted in the vehicle, the attachment portion then points in a direction, which is somewhere between laterally towards the closest side wall and upwards towards the ceiling. The attachment portion may e.g. point obliquely upwards. If the attachment portion is curved, the third direction is defined by the direction of a tangent at the end of the attachment portion.

[0020] The holding portion of the corner element may have, at least partly, an arcuate shape, the first and second legs forming portions of the arcuate shape. The angle α is then defined by the directions of a tangent to the shape of the legs at the ends of the respective leg, as described above for non-straight legs.

[0021] The third direction may form an angle β_1 with the first direction, such that $90^\circ \leq \beta_1 \leq 180^\circ$, preferably $100^\circ \leq \beta_1 \leq 165^\circ$, more preferably $110^\circ \leq \beta_1 \leq 150^\circ$, most preferably $120^\circ \leq \beta_1 \leq 140^\circ$. Then the angle β_2 to the second direction D_2 may be given by $\beta_2 = 360^\circ - \beta_1 - \alpha$.

[0022] In a second aspect of the present invention there is provided a cargo protection device comprising a foldable and/or rollable fabric portion having two corners intended to be upwards, when the cargo protection device is mounted in a vehicle, and at least one corner element according to above located in or at one or each of the corners of the fabric portion.

[0023] The cargo protection device may be used to separate a passenger compartment from a luggage compartment of the vehicle. In particular, the cargo protection device prevents cargo from being thrown in a forward direction and hitting the users of the vehicle, in case of e.g. a frontal collision. The cargo protection device may thus be used as a partitioning wall.

[0024] The fabric portion forms a main portion of the cargo protection device. The fabric portion is made of a flexible material, such that it may be folded and/or rolled. Suitable materials are a fabric, a net or a plastic film. The fabric portion is preferably at least partly transparent, such that it is possible for the driver of the vehicle to see through it when looking backwards in the vehicle, e.g. through a mirror.

[0025] The cargo protection device typically has a shape of substantially a rectangle, a square, or a trapezium. The shape is preferably adapted to the vehicle, wherein it is intended to be mounted, e.g. the upper edge may be shaped to follow the curvature of the ceiling of the vehicle, wherein it is intended to be mounted.

[0026] In a preferred embodiment, there is one corner element according to the disclosure in, or at, each of the two corners of the cargo protection device intended to be upwards, when the cargo protection device is mounted in the vehicle. However, the cargo protection device would also work with a corner element in only one of the upper corners.

[0027] The size of the corner element is typically much less than the size of the cargo protection device, as described above. Thus, even if the corner element is made of a rigid material, the cargo protection device may be folded and/or rolled as one unit.

[0028] With the cargo protection device according to the invention, it is possible to omit using an elongated stiff element, such as one or more stiff bars along the upper edge of the fabric portion, which is commonly used according to prior art technology. In fact, it is according to the invention possible to provide a cargo protection device without any other stiff element than the corner element/s, such that the cargo protection device may be folded and/or rolled as a whole. This also keeps the weight of the cargo protection device low and reduces its cost.

[0029] The fabric portion may comprise an edge trim, the edge trim also being foldable and/or rollable, such that the edge trim may be rolled or folded together with the rest of the fabric portion. The edge trim is preferably formed in one part and encloses at least 50%, preferably at least 70%, more preferably at least 90%, most preferably substantially all of a circumference of the fabric portion. It is thus to be noted that the edge trim by itself is not rigid, and the edge trim will easily bend. The edge trim does thus not comprise a stiff bar. It would in principle be possible to insert a bar in the edge trim, but that would make it non-foldable and rollable only in one direction. However, as is described below, there is, in the cargo protection device according to the invention, no need for a stiff bar in order to provide the cargo protection device with a taut upper edge, since the corner element/s will stretch the upper edge of the fabric portion. In addition, the corner element can be shaped to follow the curvature of the ceiling of the vehicle.

[0030] The edge trim may comprise a belt, e.g. a belt similar to the belts which are used as safety belts. Such an edge trim may be folded and/or rolled, and is yet strong enough to withstand a considerable force, if pulled in its length direction.

[0031] The fabric portion may further comprise a pocket wall, the pocket wall together with a portion of the fabric portion forming a pocket. The pocket may be used for storing items, when the cargo protection device is in use. When the cargo protection device is not in use, the pocket may be used to store the rest of cargo protection device by folding or rolling the rest of the fabric portion into the pocket.

[0032] The pocket may be formed along an edge of the fabric portion, preferably along the edge being intended to be a lower edge when the cargo protection device is mounted in a vehicle.

[0033] The pocket wall may have a first long side edge attached to the edge of the fabric portion, a first side edge attached to a portion of a first side edge of the fabric portion, a second side edge attached to a portion of a second side edge of the fabric portion. One or more engagement means may be arranged at or adjacent to a second long side edge of the pocket wall for engagement with the fabric portion, the engagement means for example comprising a button and/or a hook and loop arrangement. In that case it may be beneficial, if the pocket wall extends all the way out to the side edges of the fabric

portion, such that the pocket has the same width as the rest of the fabric portion, which hence is easy to roll and place in the pocket.

[0034] The fabric portion may also have two additional corners intended to be downwards, when the cargo protection device is mounted in a vehicle, hence being lower corners. The cargo protection device may further comprise at least one connection means at or adjacent to one, or each, of the additional corners for attachment to the interior of the vehicle.

[0035] The connection means may comprise a belt adapted for attachment to the interior of the vehicle, when the cargo protection device is mounted in a front position in the vehicle. The belt preferably has an adjustable length, e.g. by adjusting the length by means of a buckle. The front position is located behind a backrest of a driver's seat and a backrest of a seat of a possible front passenger. In the front position, the cargo protection device protects the driver and a possible front seat passenger from cargo being thrown forwards from the luggage compartment.

[0036] The connection means may comprise a hook adapted for attachment to the interior of the vehicle, when the cargo protection device is mounted in a back position in the vehicle. The back position is located behind a backrest of one or more back seats. The backrests of the back seats are then in a substantially upright position, suitable for passengers in the back seat. The cargo protection device may extend substantially from the ceiling to a floor of the luggage compartment. In the back position, the cargo protection device protects the users of the back seat and/or the front seats from cargo being thrown forwards from the luggage compartment.

[0037] The above-mentioned belt may also be used for attachment of the cargo protection device in the back position in the vehicle. The belt may be provided with a hook for attachment to the interior of the vehicle.

[0038] The connection means may be resilient, e.g. comprising an elastic material, such that it is easy to connect the connection means to the interior of the vehicle in an elongated state by stretching it, and the connection means then is able to spring back and retain the cargo protection device in position with taut edges, especially a taut upper edge. The resiliency may be between 1 and 10 cm, preferably between 3 and 7 cm. The resiliency may also be used to compensate for variation in size between different cargo protection devices and/or vehicles due to production tolerances.

[0039] By providing any of the above-mentioned connection means, the cargo protection device is easy to attach to the interior of the vehicle. By providing ready attachments for both the front and back positions for the cargo protection device, the cargo protection device is ready to use without any additional manual resetting of the connection means.

[0040] In a third aspect of the present invention there is provided a vehicle comprising a cargo protection device according to above.

[0041] The vehicle may comprising a foldable back seat, wherein the height of the cargo protection device is adapted to substantially cover the interspace between the back seat in a folded position and a ceiling of the vehicle. In particular, the angle α of the legs of the corner element may be chosen, such that the cargo protection device substantially follows the shape of the ceiling, which typically has a certain curvature.

[0042] In a fourth aspect of the present invention, there is provided a method of attaching a cargo protection device according to above to an interior of a vehicle, the method comprising

- attaching both of the upper corners to the interior of the vehicle at a ceiling or a respective upper portion of a respective side wall of the vehicle by means of the corner elements,
- tensioning the cargo protection device by applying a tension force at a lower portion of the cargo protection device, preferably at the lower edge of the fabric portion, more preferably at, or adjacent to, one or each of the lower corners of the fabric portion,
- attaching the additional corners to the interior of the vehicle.

[0043] The tensioning force may be applied by utilizing the above-mentioned connection means. Further, the additional corners, i.e. the lower corners, may be attached to the interior of the vehicle by means of the above-mentioned connection means.

[0044] At least one of the upper corners is provided with a corner element according to above. Due to the special shape of the corner element, e.g. having the above-mentioned angle α between the legs, the corner element will stretch the upper edge of the fabric portion. Thereby, it is possible to omit using an elongated stiff element, such as one or more bars along the upper edge of the fabric portion, which is commonly used according to prior art technology. In fact, it is according to the invention possible to provide a cargo protection device without any other stiff element than the corner element, such that the cargo protection device may be folded and/or rolled as a whole.

BRIEF DESCRIPTION OF THE DRAWINGS

[0045] The present invention will hereinafter be further explained by means of non-limiting examples with reference to the appended drawings wherein:

Fig. 1 is a schematic view of a portion of an interior of a vehicle illustrating a cargo protection device according to the invention mounted in a front position,

Fig. 2 is a schematic view of a corner element according to the invention of the cargo protection device of Fig. 1,

Fig. 3 is a schematic view of an alternative corner element according to the invention, and

Fig. 4 is a schematic view of a portion of an interior of a vehicle illustrating the cargo protection device of Fig. 1 mounted in a back position.

[0046] It should be noted that the appended drawings are not necessarily drawn to scale and that the dimensions of some features of the present invention may have been exaggerated for the sake of clarity.

DETAILED DESCRIPTION

[0047] The invention will, in the following, be exemplified by embodiments. It should however be realized that the embodiments are included in order to explain principles of the invention and not to limit the scope of the invention, defined by the appended claims. Details from two or more of the embodiments may be combined with each other.

[0048] Figure 1 schematically illustrates a portion of an interior 10 of a vehicle 12. A cargo protection device 14 is attached in a position, wherein the cargo protection device 14 will help to protect the users of the vehicle from cargo being thrown from the luggage compartment 15 onto the users of the vehicle, e.g. when braking the vehicle 12. The cargo protection device 14 of Figure 1 occupies a front position located behind a backrest 16 of the driver's seat and a backrest 18 of a seat of a possible front passenger. The cargo protection device 14 then protects the driver and a possible front seat passenger. As an alternative, the cargo protection device 14 may instead be attached in a back position, which will be further explained in conjunction with Figure 4.

[0049] The cargo protection device 14 comprises a fabric portion 20 forming a main portion of the cargo protection device 14. The fabric portion 20 is made of a flexible material, such that it may be folded and/or rolled. Suitable materials are a fabric, a net or a plastic film. Figure 1 illustrates a fine net. The fabric portion 20 is preferably at least partly transparent, such that it is possible for the driver of the vehicle to see through it when looking backwards in the vehicle 12, e.g. through a mirror.

[0050] Positional references used herein, such as upper, lower back and front, relate to when the cargo protection device 14 is mounted in the interior 10 of the vehicle 12. However, the cargo protection device 14 can be dismounted from the interior 10 of the vehicle 12, and stored or transported as folded and/or rolled. The cargo protection device 14 may be sold as a separate item or it may be sold together with the vehicle 12.

[0051] The fabric portion 20 comprises an edge trim 22, e.g. made of a belt. The edge trim 22 is also made of a flexible material, such that it may be folded and/or rolled together with the rest of the fabric portion 20. The edge trim 22 may e.g. comprise a belt similar to the belts, which are used as safety belts.

[0052] The edge trim 22 is formed in one part and encloses a circumference of the fabric portion 20. The edge trim 22 is attached to the rest of the fabric portion 20. It may e.g. be sewn to and/or glued to the rest of the fabric portion 20. The edge trim 22 may be used to distribute forces applied at the fabric portion 20, e.g. from the cargo, in case of a braking or a collision, to attachment points to the vehicle interior 10 at upper corners 24, 26 and lower corners 28, 30 of the fabric portion 20. The edge trim 22 is also used to tension the fabric portion 20, as will be described below.

[0053] The cargo protection device 14 has a height h , which is adapted to substantially cover the interspace between a back rest 32, 34 of a back seat in a folded position and a ceiling 36 of the vehicle 12. Thereby, the cargo protection device 20 covers the lateral interspace between the backrest 16 of the driver's seat and the back rest 18 of the seat of a possible front passenger, such that cargo cannot pass in between the two front seats.

[0054] Each of the upper corners 24, 26 comprises a corner element 38, 40, which is described in detail in conjunction with Figure 2. The corner elements 38, 40 are used to attach the upper corners 24, 26 of the fabric portion 20 to the vehicle interior 10. The corner elements 38, 40 may be made of a rigid material, e.g. a metal or alloy, such as steel. They help to receive and distribute impact forces in case of a collision involving the vehicle 12, e.g. a frontal collision pushing the cargo forwards against the cargo protection device 14.

[0055] As may be gleaned from Figure 2, the corner element 38 comprises a holding portion 42 and an attachment portion 44. The corner element is in Figure 2 illustrated in untensioned state. The holding portion 42 comprises a first leg 46 and a second leg 48 connected by a central portion 50. The central portion 50 is in the illustrated case rather short. It bridges the legs 46, 48 and provides a suitable location for fixing the attachment portion 44 to the rest of the corner element 38. If the corner element 38 is made of a metal or alloy, such as steel, the attachment portion 44 may be welded to the central portion 50. The edge trim 22 forms a channel in which the legs 46, 48 are, at least partly, but in this case substantially fully inserted. The fabric portion 20 has a small opening 51 through which the attachment portion 44 protrudes from the central portion 50.

[0056] The first leg 46 extends from the central portion 50 in a first direction D_1 and the second leg 48 extends from the central portion 50 in a second direction D_2 , such that the first D_1 and second directions D_2 in an untensioned state, as in Figure 2, form an angle α with each other, with $90^\circ < \alpha < 110^\circ$. The holding portion 42 has an arcuate shape. Therefore the directions D_1 , D_2 of the respective legs 46, 48 are determined as the direction of a tangent to the arcuate shape at the ends 52, 53 of the respective leg 46, 48. The angle α is preferably chosen, such that the cargo protection device 14 substantially follows the shape of the ceiling 36, which typically has a certain curvature.

[0057] The attachment portion 44 comprises an elongated portion 54 ending by an attachment means 56. The attachment means 56 is adapted for easy attachment to the vehicle, preferably without any use of tools. The illustrated embodiment show a mushroom-shaped head adapted to fit into a receiving cavity 58 in the ceiling 36 or an upper portion of a side wall 60 of the vehicle 12. As an alternative, the attachment portion 44 may be attached by a hook comprised in either the attachment portion 44, or in the ceiling 36 or side wall 60.

[0058] The attachment portion 44 extends from the central portion 50 in a third direction D_3 , which is partly opposite to the first direction D_1 and partly opposite to the second direction D_2 . The third direction D_3 of the attachment portion 44 forms an angle β_1 with the first direction D_1 , such that $90^\circ \leq \beta_1 \leq 180^\circ$, preferably $100^\circ \leq \beta_1 \leq 165^\circ$, more preferably $110^\circ \leq \beta_1 \leq 150^\circ$ most preferably $120^\circ \leq \beta_1 \leq 140^\circ$. Thereby the angle β_2 to the second direction D_2 is given by $\beta_2 = 360^\circ - \beta_1 - \alpha$. The attachment portion 44 is non-rotationally connected to the holding portion 42. There is hence no rotational movement in a location 59, where the attachment portion 44 meets the holding portion 42, even when the fabric portion 20 is tensioned.

[0059] Figure 3 illustrates an alternative embodiment of the corner element 38, wherein the central portion 50 is reinforced by a reinforcement 55. Preferably, the reinforcement 55 has a shape and a size fitting in the channel formed by the edge trim 22, or the channel may be locally wider. The other details of the alternative embodiment are similar to those of the corner element of Figure 2 and will not be explained again.

[0060] Returning again to Figure 1, it may be gleaned from the figure that the fabric portion 20 of the cargo protection device 14 further comprises a pocket wall 62. The pocket wall 62 is attached to a lower edge 64 of the fabric portion 20, e.g. by sewing and/or gluing it together with the edge trim 22 to the fabric portion 20. The pocket wall 62 is also attached to a lower portion of a first side edge 66 of the fabric portion 20 and a lower portion of a second opposite side edge 68 of the fabric portion 20. The fabric portion also comprises a fourth edge, an upper edge 70 being opposite to the lower edge 64.

[0061] One or more engagement means 72a, 72b, 72c are arranged at or adjacent to an upper edge 73 of the pocket wall 62. The fabric portion 20 comprises corresponding engagement means 74a, 74b, 74c for receiving the engagement means 72a, 72b, 72c of the pocket wall 62. Thereby a pocket 76 is formed by the pocket wall 62 and a portion of the fabric portion 20, which portion is extending between the lower edge 64 and a position of the fabric portion 20 corresponding to the upper edge 73 of the pocket wall 62. The pocket 76 may be used for storing items, when the cargo protection device 14 is in use. When the cargo protection device 14 is not in use, the pocket 76 may be used to store the rest of cargo protection device 14 by folding or rolling the rest of the fabric portion 20 into the pocket 76. In that case it is ben-

eficial, if the pocket wall 62 extends all the way out to the side edges 66, 68, such that the pocket 76 has the same width as the rest of the fabric portion 20.

[0062] The cargo protection device 14 further comprises at least one connection means 78, 80 for connecting the lower edge 64 to the interior 10 of the vehicle 12. In the illustrated embodiment of Figure 1, there is one at each lower corner 28, 30. The connection means 78, 80 comprises a belt with an adjustable length, which belt is adapted to be attached to the vehicle interior 10, e.g. to an attachment means at a floor of the vehicle 12, e.g. an ISO fix attachment means, or to an attachment means fixed to the chair rail of one the front seats (not visible in Figure 1). The connection means 78, 80 are attached in the vicinity of the lower corners 28, 30 of the fabric portion 20. The attachment means at the floor or chair rail may comprise a loop and the connection means 78, 80 may comprise a hook (not visible in Figure 1), which is adapted to grip into the loop. In addition to being adjustable, or as a complement, the connection means 78, 80 may be resilient, e.g. comprising an elastic material, such that it is easy to connect the connection means 78, 80 in an elongated state and the connection means 78, 80 then springs back and retains the cargo protection device 14 in the intended position. The resiliency may be between 1 and 10 cm, preferably between 3 and 7 cm. The resiliency may also be used to compensate for variation in size between different cargo protection devices 14 and/or vehicles 12 due to production tolerances.

[0063] The cargo protection device 14 may also be utilized in a back position, as is illustrated in Figure 4. The backrests 32, 34 of the back seats are then in a substantially upright position, suitable for passengers in the back seat. The cargo protection device 14 extends substantially from the ceiling 36 to a floor 82 of the luggage compartment 15. The lower corners 28, 30 are attached by a connection means, here in the form of a hook 84, 86 at each lower corner 28, 30 gripping around a respective receiving loop 88, 90 in the interior 10 of the vehicle 12. The hooks 84, 86 may be resiliently attached to the fabric portion 20, such that they are adapted to be easily attached to the loops 88, 90 and yet spring back and retain the cargo protection device 14 in position. The upper corners 24, 26 are attached in a similar way as for Figure 1.

[0064] Normally, the cargo protection device 14 is adapted for attachment at either the front position or the back position. It is thus provided with both the connection means 78, 80 illustrated in Figure 1 and the connection means, the hooks 84, 86 of Fig 3. By providing ready connection means for both the front and back positions, the cargo protection device 14 is ready to use without any additional manual resetting of the connection means.

[0065] When mounting the cargo protection device 14 to the interior 10 of the vehicle 12, the attachment means 56 of the corner elements 38, 40 are engaged with the ceiling 36 or the upper portion of a side wall 60. In the illustrated embodiment, the mushroom-shaped head is inserted into the receiving cavity 58 in the ceiling 36 in

either the front position of the cargo protection device 14, as in Figure 1, or in the back position, as in Figure 4. The receiving cavity 58 has an opening portion, where it is possible to insert the mushroom-shaped head of the attachment means 56 and another opening having a width less than that of the mushroom-shaped head but larger than or as large as that of elongated portion 54, keeping the mushroom-shaped head in place, once it has been inserted.

[0066] Thereafter the cargo protection device 14 is tensioned by applying a tension force at a lower portion of the cargo protection device 14, e.g. at the lower edge 64. Preferably the force is applied at or in the vicinity of the lower corners 28, 30, e.g. by tensioning the connection means 78, 80. Thereby the fabric portion 20 is stretched. In particular, the corner element 38, 40 will stretch the upper edge 70 of the fabric portion 20. It is hence possible to omit using an elongated stiff element, such as one or more elongated stiff bars along the upper edge 70 of the fabric portion 20, which is commonly used according to prior art technology. In fact, it is according to the invention possible to provide a cargo protection device 14 without any other stiff element than the corner element, such that the cargo protection device 14 may be folded and/or rolled as a whole.

[0067] Further modifications of the invention within the scope of the appended claims are feasible. As such, the present invention should not be considered as limited by the embodiments and figures described herein. Rather, the full scope of the invention should be determined by the appended claims, with reference to the description and drawings.

Claims

1. A corner element (38, 40) for attachment of a cargo protection device (14) to an interior (10) of a vehicle (12), said corner element (38, 40) comprising
 - a holding portion (42), adapted to be located at least partly in or at a corner (24, 26) of said cargo protection device (14) intended to be upwards, when said cargo protection device (14) is mounted in the vehicle (12),
 - an attachment portion (44), for attachment of said corner element (38, 40) to said interior (10) of said vehicle (12),
 said holding portion (42) comprising a first leg (46) and a second leg (48) connected by a central portion (50), said first leg (46) extending from said central portion (50) in a first direction (D_1) and said second leg (48) extending from said central portion (50) in a second direction (D_2), such that the first (D_1) and second (D_2) directions in an untensioned state of said holding portion (42) form an angle α with each other with $90^\circ < \alpha < 110^\circ$,

- said attachment portion (44) extending from said central portion (50) of said holding portion (42) in a third direction (D_3), which third direction (D_3) has a first component in a direction opposite to said first direction (D_1) and a second component in a direction opposite to said second direction (D_2).
2. The corner element (38, 40) according to claim 1, wherein said holding portion (42) has at least partly an arcuate shape, said first and second legs (46, 48) forming portions of said arcuate shape.
 3. The corner element (38, 40) according to claim 1 or 2, wherein said third direction (D_3) forms an angle β_1 with said first direction (D_1), such that $90^\circ \leq \beta_1 \leq 180^\circ$, preferably $100^\circ \leq \beta_1 \leq 165^\circ$, more preferably $110^\circ \leq \beta_1 \leq 150^\circ$, most preferably $120^\circ \leq \beta_1 \leq 140^\circ$.
 4. A cargo protection device (14) comprising
 - a foldable and/or rollable fabric portion (20) having two corners (24, 26) intended to be upwards, when said cargo protection device (14) is mounted in a vehicle (12), and
 - at least one corner element (38, 40) according to any one of the preceding claims located in or at one or each of said corners (24, 26) of said fabric portion (20).
 5. The cargo protection device (14) according to claim 4, wherein said fabric portion (20) comprises an edge trim (22), said edge trim (22) also being foldable and/or rollable, said edge trim (22) being formed in one part and enclosing at least 50%, preferably at least 70%, more preferably at least 90%, most preferably substantially all of a circumference of said fabric portion (20).
 6. The cargo protection device (14) according to claim 5, wherein said foldable edge trim (22) comprises a belt.
 7. The cargo protection device (14) according to any one of claims 4-6, wherein said fabric portion (20) further comprises a pocket wall (62), said pocket wall (62) together with a portion of said fabric portion (20) forming a pocket (76).
 8. The cargo protection device (14) according to claim 7, wherein said pocket (76) is formed along an edge (64) of said fabric portion (20), preferably said edge (64) being intended to be a lower edge, when said cargo protection device (14) is mounted in a vehicle (12).
 9. The cargo protection device (14) according to claim 7 or 8, wherein said pocket wall (62) has a first long side edge attached to said edge (64) of said fabric portion (20), a first side edge attached to a portion of a first side edge (66) of said fabric portion (20), a second side edge attached to a portion of a second side edge (68) of said fabric portion (20), and wherein one or more engagement means (72a, 72b, 72c) are arranged at or adjacent to a second long side edge (73) of said pocket wall (62) for engagement with said fabric portion (20), said engagement means (72a, 72b, 72c) for example comprising a button and/or a hook and loop arrangement.
 10. The cargo protection device (14) according to any one of claims 4-9, wherein said fabric portion (20) has two additional corners (28, 30) intended to be downwards when said cargo protection device (14) is mounted in a vehicle (12), said cargo protection device (14) further comprising at least one connection means (78, 80; 84, 86) at or adjacent to one or each of said additional corners (28, 30) for attachment to said interior (10) of said vehicle (12).
 11. The cargo protection device (14) according to claim 10, wherein said connection means (78, 80) comprises a belt adapted for attachment to said interior (10) of said vehicle (12), when said cargo protection device (14) is mounted in a front position in said vehicle (12), preferably said belt having an adjustable length.
 12. The cargo protection device (14) according to claim 10 or 11, wherein said connection means (84, 86) comprises a hook adapted for attachment to said interior (10) of said vehicle (12), when said cargo protection device (14) is mounted in a back position in said vehicle (12).
 13. The cargo protection device (14) according to any one of claims 10-12, wherein said connection means (78, 80; 84, 86) is resilient.
 14. A vehicle (12) comprising a cargo protection device (14) according to any one of claims 4-13.
 15. A method of attaching a cargo protection device (14) according to any one of claims 4-13 to an interior (10) of a vehicle (12), said method comprising
 - attaching both of said corners (24, 26) to said interior (10) of said vehicle (12) at a ceiling (36), or at a respective upper portion of a respective side wall (62) of said vehicle (12), by means of said corner elements (38, 40),
 - tensioning said cargo protection device (14) by applying a tension force at a lower portion of said cargo protection device (14), preferably at a lower edge (64) of said fabric portion (20), more preferably at or adjacent to one or each of

said additional corners (28, 30) of said fabric portion (20),
- attaching said additional corners (28, 30) to said interior (10) of said vehicle (12).

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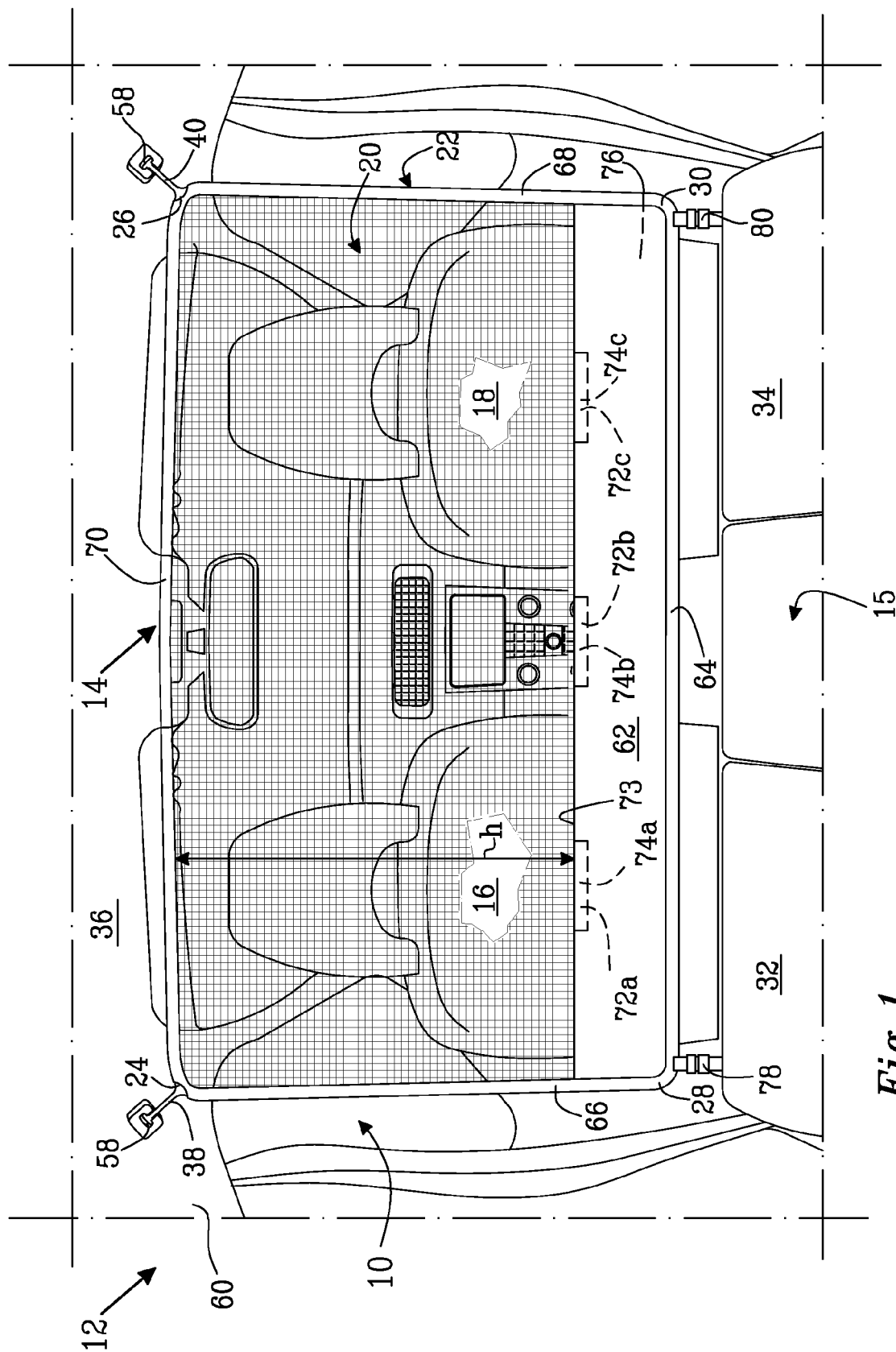
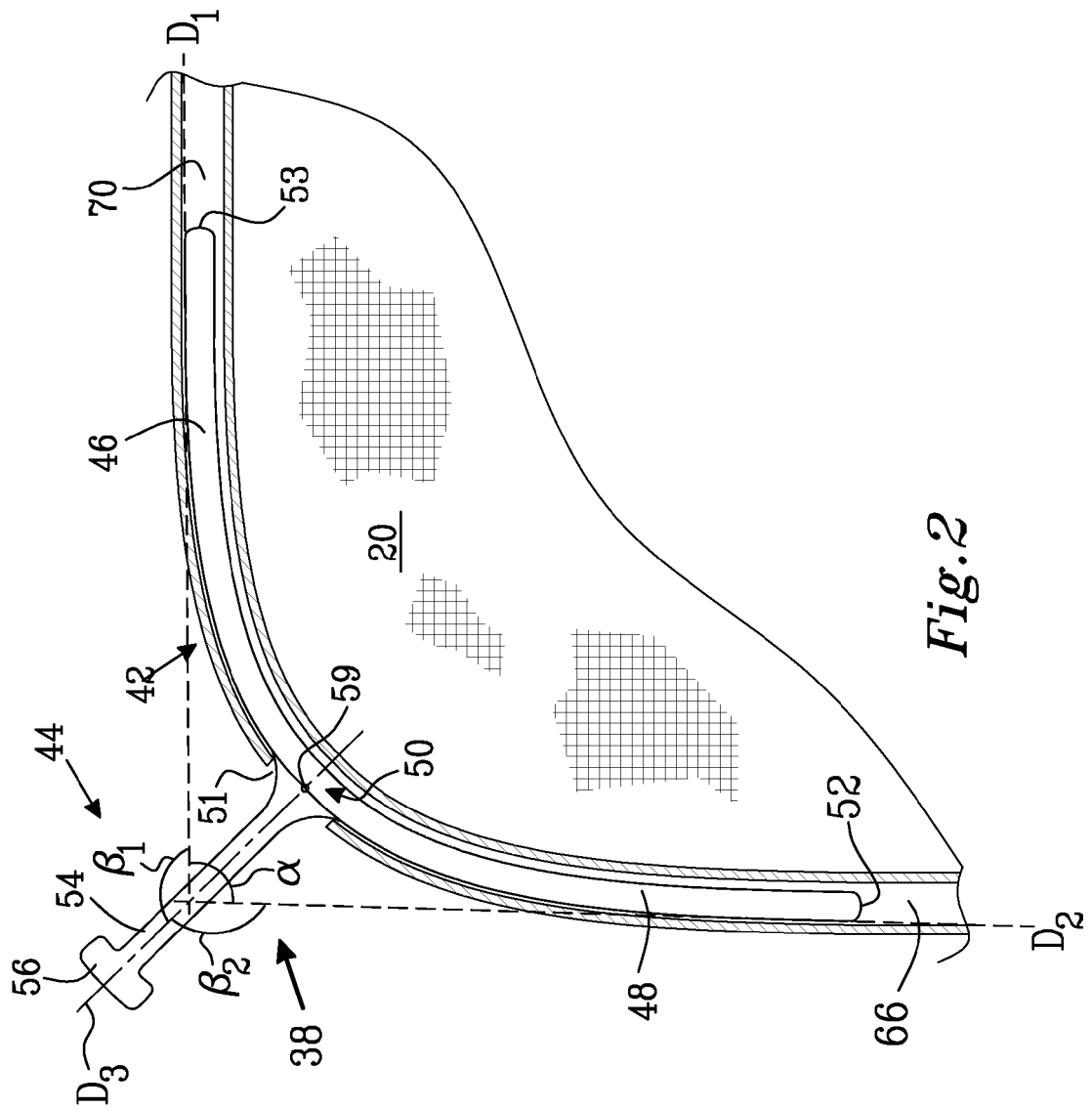
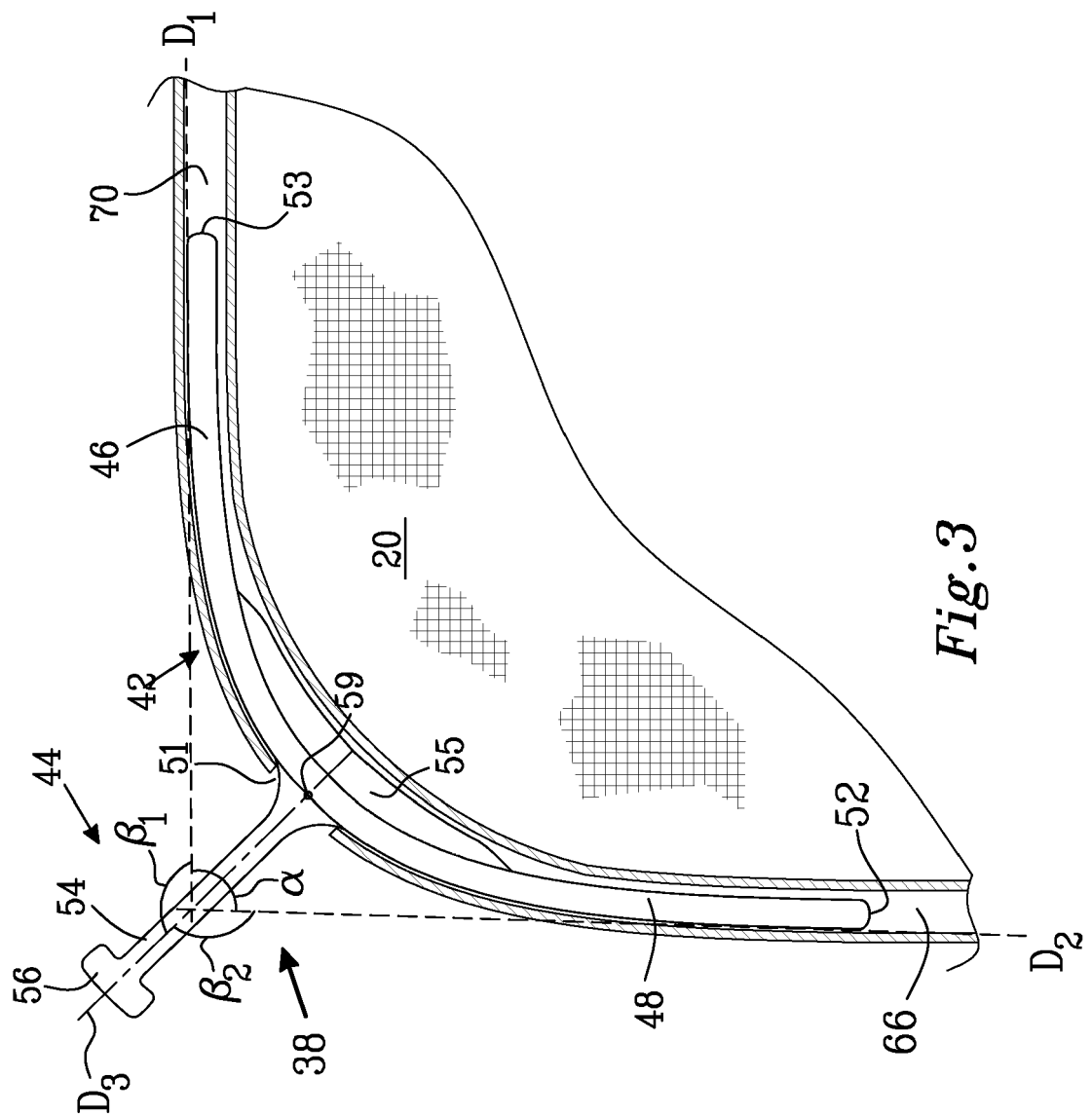


Fig. 1





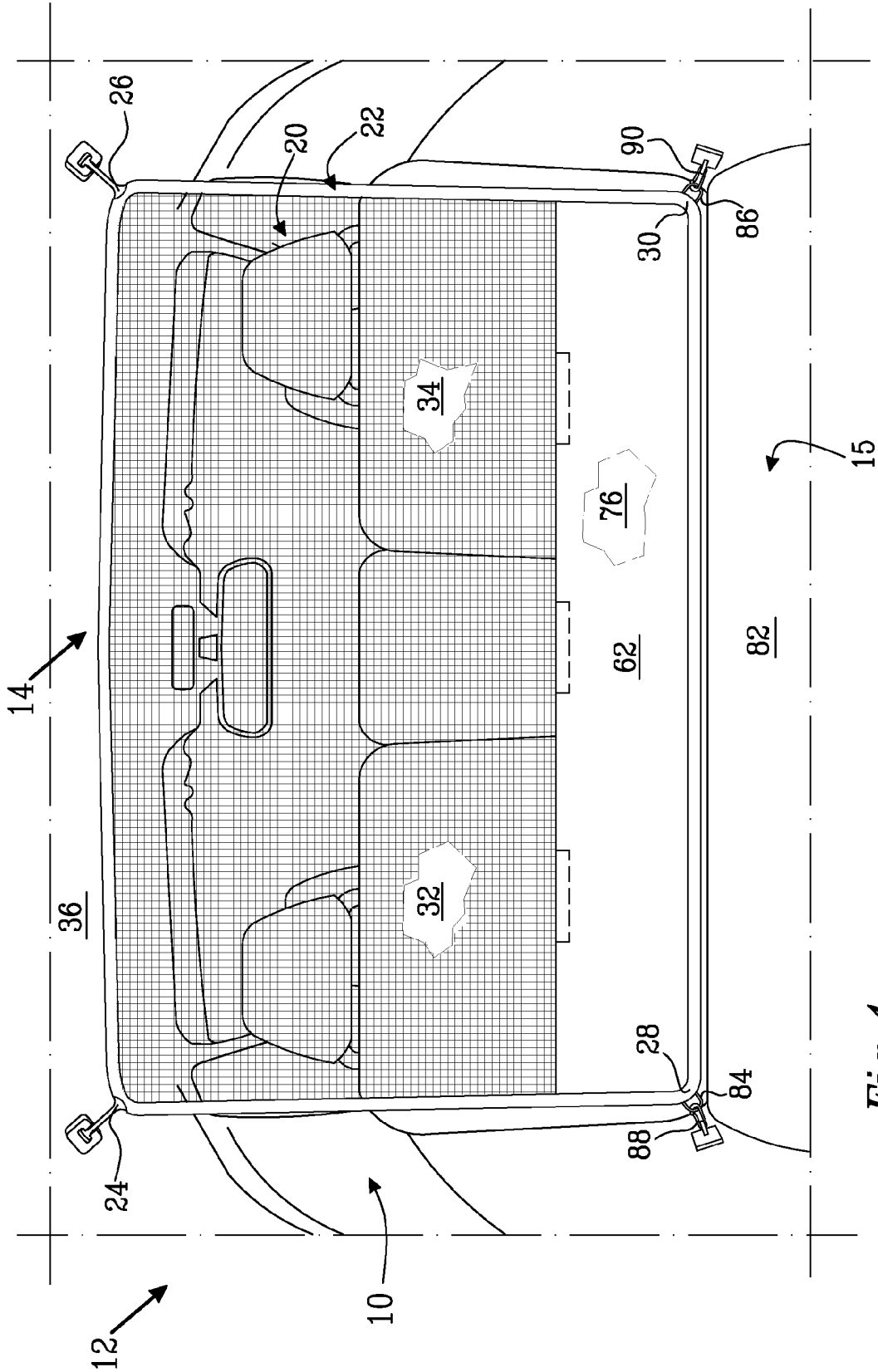


Fig. 4



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Place of search Berlin		Date of completion of the search 7 April 2014	Examiner Schäfer, Arnold
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